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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/808,117

03/24/2004

Donald Lee Gunter

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02/03/2005

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CHICAGO, IL 60606

EXAMINER

GAGLIARDI, ALBERT J

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,117

Applicant(s)

GUNTER, DONALD LEE

Examiner

Albert J. Gagliardi

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Where the IDS citations are submitted but not described, the examiner is only responsible for cursorily reviewing the references. The initials of the examiner on the PTO-1449 indicate only that degree of review unless the reference is either applied against the claims, or discussed by the examiner as pertinent art of interest, in a subsequent office action. See Guidelines for Reexamination of Cases in View of *In re Portola Packaging, Inc.*, 110 F.3d 786, 42 USPQ2d 1295 (Fed. Cir. 1997), 64 FR at 15347, 1223 Off. Gaz. Pat. Office at 125 (response to comment 6). Consideration by the examiner of the information submitted in an IDS means that the examiner will consider the documents in the same manner as other documents in Office search files are considered by the examiner while conducting a search of the prior art in a proper field of search. The initials of the examiner placed adjacent to the citations on the PTO-1449 or PTO/SB/08A and 08B or its equivalent mean that the information has been considered by the examiner to the extent noted above. MPEP § 609 (Eighth Edition, August 2001).

The examiner notes that due to the unusually large number of non-patent references cited, and the absence and/or limited description of the relevance of the references, it should be assumed that only the most cursory review of the cited documents consistent with these guidelines has been performed. If applicant is aware of any information that might be of particular relevance, it should be pointed out in order to insure a higher degree consideration.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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3. Claims 1-20, 21-23, 26-28, and 29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

4. The examiner notes that claims 1-16 and 29 are directed to a method of reconstructing an image from a Compton camera wherein the ultimate result of the process is the development of a source distribution function, i.e., a mathematical algorithm representing nothing more than an abstract idea, and is not statutory. The examiner also notes that even if this process were considered to be a computer related process (suggested by steps of data acquisition and mapping), the claims would not be statutory. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application within the technological arts. See generally MPEP 2106.

In this case, there is no physical transformation outside of the computer, and/or the claims are not limited to a practical application in the arts.

The examiner additionally notes that a process that merely manipulates an abstract idea or performs a purely mathematical algorithm is nonstatutory despite the fact that it might inherently have some usefulness. In *Sarkar*, 588 F.2d at 1335, 200 USPQ at 139, the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a "process" under 101. Consideration of whether the substitution of specific values is enough to convert the

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disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

In this case, the ultimate result is the creation of a source distribution function, an abstract idea and a purely mathematical algorithm.

5. Regarding claims 17-20, the examiner notes the claims are directed to a computer readable medium having instructions for performing methods according to claims 1, 4, 5 and 6, but that the underlying methods are non-statutory as noted above. As such, the claims themselves are considered non-statutory. See generally MPEP 2106.

6. Regarding claims 21-23 and 26-28, the claims are directed to a computer related product, but the claims are not limited to a machine or manufacture which has a practical application in the technological arts because it does not produce a useful and tangible result. See MPEP 2106-2(a).

In this case, the outcome result of the product is a transformation of data and the creation of source distribution function (i.e. an intangible mathematical algorithm) without any production of a useful and tangible result (i.e. a reconstructed image of the source distribution).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 24-25, as dependent on claim 21, are rejected under 35 U.S.C. 103(a) as being unpatentable over Basko *et al.* (US 5,861,627) in view of Parra, "Reconstruction of Cone-Beam

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Projections from Compton Scattered Data”, IEEE transactions on Nuclear Science, Vol. NS-47, pp. 1543-1550 (2000).

Regarding claim 24, Basko discloses (Fig. 1) an apparatus for reconstructing a reconstructed image of a radiopharmaceutical source distribution comprising: a Compton camera (14); a processor (32, 34, 40, etc.) that is coupled to the Compton camera to receive camera data, the processor configured to perform:

(a) obtaining observed data from the Compton camera (32), the observed data resulting from a source distribution (col. 1, lines 21-23);

(b) mapping the observed data by backprojection (40) to form a backprojected function (col. 3, line 60 to col. 4, line 23);

(c) determining an intermediate function (41) from the backprojected function, wherein the intermediate function is dependent on an associated transform of the backprojected function (col. 4, lines 23-35);

(d) filtering the intermediate function (44) to form a filtered function, wherein the filtered function corresponds to a corresponding transform of a source distribution function (col. 4, lines 30-44) ; reconstructing an image based on the function (col. 4, lines 36-39).

Regarding the: (e) inverse transforming the filtered function to obtain the source distribution function, Parra discloses an alternative and/or improvement to the type of processing suggested by Basko wherein a three-dimensional source distribution function is established by reconstructing cone-beam projections from Compton data followed by deconvolution directly, or by an intermediate function (i.e., a spherical harmonics transform) followed by filtering and inverse transforming (page 1, col. 2, 2nd par.; page 5, col. 2, 1st par.).

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Parra teaches that, among other benefits, certain Compton scatter measurement errors can be accounted for in the new algorithm (page 1, col. 1, 1st par (abstract). Therefore it would have been obvious to a person of ordinary skill in the art to modify the system suggested by *Basko* to further include at least the step of inverse transforming the filtered function to obtain an improved source distribution function.

Regarding claim 25, in the system suggested by *Basko* in view of *Parra*, *Basko* further discloses a repositioning module (16, 16a, 18) that instructs the Compton camera to reposition along a patient's body to reconstruct a three-dimensional image of the radiopharmaceutical source (see generally Fig. 1).

Note: The examiner notes that many of the dependent claims, while not related to statutory subject matter, further include more specific limitations relating either to the steps and/or variables involved in arriving at the source distribution function, or the detector data or geometry. Even if the limitations were considered, the examiner notes that the specific limitations generally relate only to result effective variables (i.e. specific parameters) or routine design choices (i.e., size and shape of the components) which, absent some degree of criticality, would have been obvious to a person of routine skill in the art.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert J. Gagliardi whose telephone number is (571) 272-2436.

The examiner can normally be reached on Monday thru Friday from 9 AM to 5 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Albert J. Gagliardi
Primary Examiner
Art Unit 2878

AJG